

Abstract

Particle-optical apparatus with a permanent-magnetic lens and an electrostatic lens.

5 Particle-optical apparatus are normally embodied with a magnetic or
electrostatic lens so as to focus a beam 1 of charged particles onto a sample 8. It is
desirable to be able to use these apparatus at different beam energies. It is, however,
undesirable that the focus position 9 of the beam, as a result hereof, should shift with
respect to the sample 8. Use of a permanent-magnetic material 6 in a magnetic lens has
10 advantages as regards compact construction, but is normally avoided because it is not
easily possible to adjust the lens power to match varying beam energies.
The invention shows how it is possible to keep constant the focus position 9, independent
of the energy of the particles in the beam 1, by combining a magnetic lens – that has been
furnished with permanent-magnetic material – with an electrostatic lens. The electrostatic
15 lens is embodied in that case as an accelerating lens.

(Figure 2)